



## SEQUENCE LISTING

<110> Shaw , Jei-Fu  
Lai, Chia-Ping

<120> PLANT TUBBY-LIKE PROTEINS

<130> 08919-099001

<140> US 10/763,042

<141> 2004-01-21

<150> US 60/441,380

<151> 2004-01-21

<160> 51

<170> FastSEQ for Windows Version 4.0

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Gly	Gly	Lys	Ser	Arg	Gly	Ser	Val	Gln	Asp	Ser	His	Glu	Glu	Gln	Leu
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Leu	Arg	Asp	Val	Ile	Lys	Arg	Leu	Glu	Glu	Ser	Glu	Ser	Val	Trp	Pro
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Ala	Arg	Arg	His	Val	Val	Ala	Cys	Ala	Ser	Val	Cys	Arg	Ser	Trp	Arg
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Asp	Met	Cys	Lys	Glu	Ile	Val	Gln	Ser	Pro	Glu	Leu	Ser	Gly	Lys	Ile
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Thr	Phe	Pro	Val	Ser	Leu	Lys	Gln	Pro	Gly	Pro	Arg	Asp	Ala	Thr	Met
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Gln	Cys	Phe	Ile	Lys	Arg	Asp	Lys	Ser	Asn	Leu	Thr	Tyr	His	Leu	Tyr
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Leu	Cys	Leu	Ser	Pro	Ala	Leu	Leu	Val	Glu	Asn	Gly	Lys	Phe	Leu	Leu
145					150					155					160
Ser	Ala	Lys	Arg	Ile	Arg	Arg	Thr	Thr	Tyr	Thr	Glu	Tyr	Val	Ile	Ser
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Met	His	Ala	Asp	Thr	Ile	Ser	Arg	Ser	Ser	Asn	Thr	Tyr	Ile	Gly	Lys
		180						185					190		
Ile	Arg	Ser	Asn	Phe	Leu	Gly	Thr	Lys	Phe	Ile	Ile	Tyr	Asp	Thr	Gln
	195						200					205			
Pro	Ala	Tyr	Asn	Ser	Asn	Ile	Ala	Arg	Ala	Val	Gln	Pro	Val	Gly	Leu
	210					215					220				
Ser	Arg	Arg	Phe	Tyr	Ser	Lys	Arg	Val	Ser	Pro	Lys	Val	Pro	Ser	Gly

225                      230                      235                      240  
 Ser Tyr Lys Ile Ala Gln Val Ser Tyr Glu Leu Asn Val Leu Gly Thr  
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 Arg Gly Pro Arg Arg Met His Cys Ala Met Asn Ser Ile Pro Ala Ser  
                                  260                      265                      270  
 Ser Leu Ala Glu Gly Gly Thr Val Pro Gly Gln Pro Asp Ile Ile Val  
                                  275                      280                      285  
 Pro Arg Ser Ile Leu Asp Glu Ser Phe Arg Ser Ile Thr Ser Ser Ser  
                                  290                      295                      300  
 Ser Arg Lys Ile Thr Tyr Asp Tyr Ser Asn Asp Phe Ser Ser Ala Arg  
 305                                   310                      315                      320  
 Phe Ser Asp Ile Leu Gly Pro Leu Ser Glu Asp Gln Glu Val Val Leu  
                                  325                      330                      335  
 Glu Glu Gly Lys Glu Arg Asn Ser Pro Pro Leu Val Leu Lys Asn Lys  
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 Pro Pro Arg Trp His Glu Gln Leu Gln Cys Trp Cys Leu Asn Phe Arg  
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 Gly Arg Val Thr Val Ala Ser Val Lys Asn Phe Gln Leu Ile Ala Ala  
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 Asn Gln Pro Gln Pro Gln Pro Gln Pro Gln Pro Gln Pro Gln Pro Leu  
 385                                   390                      395                      400  
 Thr Gln Pro Gln Pro Ser Gly Gln Thr Asp Gly Pro Asp Lys Ile Ile  
                                  405                      410                      415  
 Leu Gln Phe Gly Lys Val Gly Lys Asp Met Phe Thr Met Asp Phe Arg  
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 Tyr Pro Leu Ser Ala Phe Gln Ala Phe Ala Ile Cys Leu Ser Ser Phe  
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 Asp Thr  
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<210> 2

<211> 394

<212> PRT

<213> Arabidopsis sp.

<400> 2

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                                  20                                   25                                   30  
 Pro Asp Gln Thr Thr Pro Pro Leu Asp Asn Ile Pro Gln Ser Pro Trp  
                                  35                                   40                                   45  
 Ala Ser Leu Pro Pro Glu Leu Leu His Asp Ile Ile Trp Arg Val Glu  
                                  50                                   55                                   60  
 Glu Ser Glu Thr Ala Trp Pro Ala Arg Ala Ala Val Val Ser Cys Ala  
 65                                   70                                   75                                   80  
 Ser Val Cys Lys Ser Trp Arg Gly Ile Thr Met Glu Ile Val Arg Ile  
                                  85                                   90                                   95  
 Pro Glu Gln Cys Gly Lys Leu Thr Phe Pro Ile Ser Leu Lys Gln Pro  
                                  100                                   105                                   110  
 Gly Pro Arg Asp Ser Pro Ile Gln Cys Phe Ile Lys Arg Asn Arg Ala  
                                  115                                   120                                   125  
 Thr Ala Thr Tyr Ile Leu Tyr Tyr Gly Leu Met Pro Ser Glu Thr Glu  
                                  130                                   135                                   140  
 Asn Asp Lys Leu Leu Leu Ala Ala Arg Arg Ile Arg Arg Ala Thr Cys  
 145                                   150                                   155                                   160  
 Thr Asp Phe Ile Ile Ser Leu Ser Ala Lys Asn Phe Ser Arg Ser Ser

				165					170					175			
Ser	Thr	Tyr	Val	Gly	Lys	Leu	Arg	Ser	Gly	Phe	Leu	Gly	Thr	Lys	Phe		
			180						185					190			
Thr	Ile	Tyr	Asp	Asn	Gln	Thr	Ala	Ser	Ser	Thr	Ala	Gln	Ala	Gln	Pro		
		195					200					205					
Asn	Arg	Arg	Leu	His	Pro	Lys	Gln	Ala	Ala	Pro	Lys	Leu	Pro	Thr	Asn		
	210					215					220						
Ser	Ser	Thr	Val	Gly	Asn	Ile	Thr	Tyr	Glu	Leu	Asn	Val	Leu	Arg	Thr		
225					230					235					240		
Arg	Gly	Pro	Arg	Arg	Met	His	Cys	Ala	Met	Asp	Ser	Ile	Pro	Leu	Ser		
			245						250					255			
Ser	Val	Ile	Ala	Glu	Pro	Ser	Val	Val	Gln	Gly	Ile	Glu	Glu	Glu	Val		
		260						265				270					
Ser	Ser	Ser	Pro	Ser	Pro	Lys	Gly	Glu	Thr	Ile	Thr	Thr	Asp	Lys	Glu		
	275					280					285						
Ile	Pro	Asp	Asn	Ser	Pro	Ser	Leu	Arg	Asp	Gln	Pro	Leu	Val	Leu	Lys		
	290					295				300							
Asn	Lys	Ser	Pro	Arg	Trp	His	Glu	Gln	Leu	Gln	Cys	Trp	Cys	Leu	Asn		
305				310					315					320			
Phe	Lys	Gly	Arg	Val	Thr	Val	Ala	Ser	Val	Lys	Asn	Phe	Gln	Leu	Val		
			325					330					335				
Ala	Glu	Ile	Asp	Ala	Ser	Leu	Asp	Ala	Pro	Pro	Glu	Glu	His	Glu	Arg		
		340				345					350						
Val	Ile	Leu	Gln	Phe	Gly	Lys	Ile	Gly	Lys	Asp	Ile	Phe	Thr	Met	Asp		
	355					360				365							
Tyr	Arg	Tyr	Pro	Leu	Ser	Ala	Phe	Gln	Ala	Phe	Ala	Ile	Cys	Ile	Ser		
	370				375					380							
Ser	Phe	Asp	Thr	Lys	Pro	Ala	Cys	Glu	Gly								
385				390													

&lt;210&gt; 3

&lt;211&gt; 406

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 3

Met	Ser	Phe	Lys	Ser	Leu	Ile	Gln	Asp	Met	Arg	Gly	Glu	Leu	Gly	Ser		
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Ile	Ser	Arg	Lys	Gly	Phe	Asp	Val	Arg	Phe	Gly	Tyr	Gly	Arg	Ser	Arg		
		20					25					30					
Ser	Gln	Arg	Val	Val	Gln	Asp	Thr	Ser	Val	Pro	Val	Asp	Ala	Phe	Lys		
	35					40					45						
Gln	Ser	Cys	Trp	Ala	Ser	Met	Pro	Pro	Glu	Leu	Leu	Arg	Asp	Val	Leu		
	50				55					60							
Met	Arg	Ile	Glu	Gln	Ser	Glu	Asp	Thr	Trp	Pro	Ser	Arg	Lys	Asn	Val		
65				70				75						80			
Val	Ser	Cys	Ala	Gly	Val	Cys	Arg	Asn	Trp	Arg	Glu	Ile	Val	Lys	Glu		
			85					90					95				
Ile	Val	Arg	Val	Pro	Glu	Leu	Ser	Ser	Lys	Leu	Thr	Phe	Pro	Ile	Ser		
		100					105					110					
Leu	Lys	Gln	Pro	Gly	Pro	Arg	Gly	Ser	Leu	Val	Gln	Cys	Tyr	Ile	Met		
	115					120					125						
Arg	Asn	Arg	Ser	Asn	Gln	Thr	Tyr	Tyr	Leu	Tyr	Leu	Gly	Leu	Asn	Gln		
	130				135					140							
Ala	Ala	Ser	Asn	Asp	Asp	Gly	Lys	Phe	Leu	Leu	Ala	Ala	Lys	Arg	Phe		
145				150					155					160			
Arg	Arg	Pro	Thr	Cys	Thr	Asp	Tyr	Ile	Ile	Ser	Leu	Asn	Cys	Asp	Asp		

				165					170					175			
Val	Ser	Arg	Gly	Ser	Asn	Thr	Tyr	Ile	Gly	Lys	Leu	Arg	Ser	Asn	Phe		
			180					185					190				
Leu	Gly	Thr	Lys	Phe	Thr	Val	Tyr	Asp	Ala	Gln	Pro	Thr	Asn	Pro	Gly		
		195					200					205					
Thr	Gln	Val	Thr	Arg	Thr	Arg	Ser	Ser	Arg	Leu	Leu	Ser	Leu	Lys	Gln		
	210					215					220						
Val	Ser	Pro	Arg	Ile	Pro	Ser	Gly	Asn	Tyr	Pro	Val	Ala	His	Ile	Ser		
225					230					235					240		
Tyr	Glu	Leu	Asn	Val	Leu	Gly	Ser	Arg	Gly	Pro	Arg	Arg	Met	Gln	Cys		
			245					250					255				
Val	Met	Asp	Ala	Ile	Pro	Ala	Ser	Ala	Val	Glu	Pro	Gly	Gly	Thr	Ala		
		260						265				270					
Pro	Thr	Gln	Thr	Glu	Leu	Val	His	Ser	Asn	Leu	Asp	Ser	Phe	Pro	Ser		
		275					280					285					
Phe	Ser	Phe	Phe	Arg	Ser	Lys	Ser	Ile	Arg	Ala	Glu	Ser	Leu	Pro	Ser		
	290					295					300						
Gly	Pro	Ser	Ser	Ala	Ala	Gln	Lys	Glu	Gly	Leu	Leu	Val	Leu	Lys	Asn		
305					310					315					320		
Lys	Ala	Pro	Arg	Trp	His	Glu	Gln	Leu	Gln	Cys	Trp	Cys	Leu	Asn	Phe		
			325					330					335				
Asn	Gly	Arg	Val	Thr	Val	Ala	Ser	Val	Lys	Asn	Phe	Gln	Leu	Val	Ala		
		340						345					350				
Ala	Pro	Glu	Asn	Gly	Pro	Ala	Gly	Pro	Glu	His	Glu	Asn	Val	Ile	Leu		
		355					360					365					
Gln	Phe	Gly	Lys	Val	Gly	Lys	Asp	Val	Phe	Thr	Met	Asp	Tyr	Gln	Tyr		
	370					375					380						
Pro	Ile	Ser	Ala	Phe	Gln	Ala	Phe	Thr	Ile	Cys	Leu	Ser	Ser	Phe	Asp		
385					390					395					400		
Thr	Lys	Ile	Ala	Cys	Glu												
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&lt;210&gt; 4

&lt;211&gt; 265

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 4

Met	Pro	Pro	Glu	Leu	Leu	Arg	Asp	Val	Leu	Met	Arg	Ile	Glu	Arg	Ser		
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Glu	Asp	Thr	Trp	Pro	Ser	Arg	Lys	Asn	Val	Val	Ser	Cys	Val	Gly	Val		
		20					25					30					
Cys	Lys	Asn	Trp	Arg	Gln	Ile	Phe	Lys	Glu	Ile	Val	Asn	Val	Pro	Glu		
		35					40					45					
Val	Ser	Ser	Lys	Phe	Thr	Phe	Pro	Ile	Ser	Leu	Lys	Gln	Pro	Gly	Pro		
	50					55					60						
Gly	Gly	Ser	Leu	Val	Gln	Cys	Tyr	Val	Lys	Arg	Asn	Arg	Ser	Asn	Gln		
65					70				75					80			
Thr	Phe	Tyr	Leu	Tyr	Leu	Gly	Gly	Glu	Ala	Lys	Ile	Phe	Cys	Gln	Ser		
			85					90						95			
Glu	Pro	Ser	Asp	Ile	Tyr	Leu	Val	Pro	Tyr	Ser	Tyr	Arg	Glu	Thr	His		
			100					105					110				
Cys	Val	Met	Asp	Ala	Ile	Ser	Ala	Ser	Ala	Val	Lys	Pro	Gly	Gly	Thr		
		115					120					125					
Ala	Thr	Thr	Gln	Thr	Glu	Leu	Asp	Asn	Phe	Val	Ser	Phe	Arg	Ser	Pro		
	130					135					140						
Ser	Gly	Gln	Lys	Glu	Gly	Val	Leu	Val	Leu	Lys	Ser	Lys	Val	Pro	Arg		

145		150		155		160									
Leu	Glu	Glu	Gln	Ser	Trp	Cys	Leu	Asp	Phe	Asn	Gly	Ser	Pro	Glu	Asn
				165					170					175	
Glu	Pro	Glu	Asn	Glu	Asn	Asp	Ile	Phe	Gln	Phe	Ala	Lys	Val	Gly	Asn
			180					185					190		
Leu	His	Lys	Leu	Phe	Ser	Leu	Tyr	Glu	Ala	Glu	Trp	Ile	Pro	Leu	Val
		195				200						205			
Arg	Thr	Ser	Val	Phe	Ala	Val	Ile	Ala	Arg	Val	Cys	Arg	Asp	Lys	Lys
	210					215					220				
His	Thr	Pro	Ser	Tyr	Glu	Leu	Lys	Leu	Ala	Leu	Tyr	Phe	Ala	Lys	Asn
225					230					235					240
Ser	Ala	Ile	Leu	Lys	Lys	Phe	Val	Leu	Arg	Gly	Tyr	Thr	Arg	Glu	Glu
			245					250						255	
Asp	Leu	Leu	Ala	Leu	Pro	Val	Ala	Asn							
			260					265							

&lt;210&gt; 5

&lt;211&gt; 429

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 5

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Phe	Ser	Arg	Arg	Ser	Phe	Asp	Val	Arg	Val	Ser	Asn	Gly	Thr	Thr	His
		20					25					30			
Gln	Arg	Ser	Lys	Ser	His	Gly	Val	Glu	Ala	His	Ile	Glu	Asp	Leu	Ile
		35				40					45				
Val	Ile	Lys	Asn	Thr	Arg	Trp	Ala	Asn	Leu	Pro	Ala	Ala	Leu	Leu	Arg
	50					55				60					
Asp	Val	Met	Lys	Lys	Leu	Asp	Glu	Ser	Glu	Ser	Thr	Trp	Pro	Ala	Arg
65				70					75					80	
Lys	Gln	Val	Val	Ala	Cys	Ala	Gly	Val	Cys	Lys	Thr	Trp	Arg	Leu	Met
			85				90						95		
Cys	Lys	Asp	Ile	Val	Lys	Ser	Pro	Glu	Phe	Ser	Gly	Lys	Leu	Thr	Phe
		100					105				110				
Pro	Val	Ser	Leu	Lys	Gln	Pro	Gly	Pro	Arg	Asp	Gly	Ile	Ile	Gln	Cys
		115				120					125				
Tyr	Ile	Lys	Arg	Asp	Lys	Ser	Asn	Met	Thr	Tyr	His	Leu	Tyr	Leu	Ser
	130				135						140				
Leu	Ser	Pro	Ala	Ile	Leu	Val	Glu	Ser	Gly	Lys	Phe	Leu	Leu	Ser	Ala
145				150					155						160
Lys	Arg	Ser	Arg	Arg	Ala	Thr	Tyr	Thr	Glu	Tyr	Val	Ile	Ser	Met	Asp
			165					170					175		
Ala	Asp	Asn	Ile	Ser	Arg	Ser	Ser	Ser	Thr	Tyr	Ile	Gly	Lys	Leu	Lys
		180					185					190			
Ser	Asn	Phe	Leu	Gly	Thr	Lys	Phe	Ile	Val	Tyr	Asp	Thr	Ala	Pro	Ala
		195				200					205				
Tyr	Asn	Ser	Ser	Gln	Ile	Leu	Ser	Pro	Pro	Asn	Arg	Ser	Arg	Ser	Phe
	210				215						220				
Asn	Ser	Lys	Lys	Val	Ser	Pro	Lys	Val	Pro	Ser	Gly	Ser	Tyr	Asn	Ile
225				230					235					240	
Ala	Gln	Val	Thr	Tyr	Glu	Leu	Asn	Leu	Leu	Gly	Thr	Arg	Gly	Pro	Arg
			245				250						255		
Arg	Met	Asn	Cys	Ile	Met	His	Ser	Ile	Pro	Ser	Leu	Ala	Leu	Glu	Pro
		260				265					270				
Gly	Gly	Thr	Val	Pro	Ser	Gln	Pro	Glu	Phe	Leu	Gln	Arg	Ser	Leu	Asp

275						280						285					
Glu	Ser	Phe	Arg	Ser	Ile	Gly	Ser	Ser	Lys	Ile	Val	Asn	His	Ser	Gly		
290						295						300					
Asp	Phe	Thr	Arg	Pro	Lys	Glu	Glu	Glu	Gly	Lys	Val	Arg	Pro	Leu	Val		
305	310					315					320						
Leu	Lys	Thr	Lys	Pro	Pro	Arg	Trp	Leu	Gln	Pro	Leu	Arg	Cys	Trp	Cys		
325					330					335							
Leu	Asn	Phe	Lys	Gly	Arg	Val	Thr	Val	Ala	Ser	Val	Lys	Asn	Phe	Gln		
340					345					350							
Leu	Met	Ser	Ala	Ala	Thr	Val	Gln	Pro	Gly	Ser	Gly	Ser	Asp	Gly	Gly		
355					360					365							
Ala	Leu	Ala	Thr	Arg	Pro	Ser	Leu	Ser	Pro	Gln	Gln	Pro	Glu	Gln	Ser		
370					375					380							
Asn	His	Asp	Lys	Ile	Ile	Leu	His	Phe	Gly	Lys	Val	Gly	Lys	Asp	Met		
385	390					395					400						
Phe	Thr	Met	Asp	Tyr	Arg	Tyr	Pro	Leu	Ser	Ala	Phe	Gln	Ala	Phe	Ala		
405					410					415							
Ile	Ser	Leu	Ser	Thr	Phe	Asp	Thr	Lys	Leu	Ala	Cys	Glu					
420					425												

<210> 6

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<212> PRT

<213> Arabidopsis sp.

<400> 6

Met	Ser	Leu	Lys	Asn	Ile	Val	Lys	Asn	Lys	Tyr	Lys	Ala	Ile	Gly	Arg
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Arg	Gly	Arg	Ser	His	Ile	Ala	Pro	Glu	Gly	Ser	Ser	Val	Ser	Ser	Ser
			20					25					30		
Leu	Ser	Thr	Asn	Glu	Gly	Leu	Asn	Gln	Ser	Ile	Trp	Val	Asp	Leu	Pro
		35					40					45			
Pro	Glu	Leu	Leu	Leu	Asp	Ile	Ile	Gln	Arg	Ile	Glu	Ser	Glu	Gln	Ser
	50				55					60					
Leu	Trp	Pro	Gly	Arg	Arg	Asp	Val	Val	Ala	Cys	Ala	Ser	Val	Cys	Lys
65				70					75					80	
Ser	Trp	Arg	Glu	Met	Thr	Lys	Glu	Val	Val	Lys	Val	Pro	Glu	Leu	Ser
			85					90					95		
Gly	Leu	Ile	Thr	Phe	Pro	Ile	Ser	Leu	Arg	Gln	Pro	Gly	Pro	Arg	Asp
			100					105				110			
Ala	Pro	Ile	Gln	Cys	Phe	Ile	Lys	Arg	Glu	Arg	Ala	Thr	Gly	Ile	Tyr
		115					120				125				
Arg	Leu	Tyr	Leu	Gly	Leu	Ser	Pro	Ala	Leu	Ser	Gly	Asp	Lys	Ser	Lys
	130					135					140				
Leu	Leu	Leu	Ser	Ala	Lys	Arg	Val	Arg	Arg	Ala	Thr	Gly	Ala	Glu	Phe
145				150						155				160	
Val	Val	Ser	Leu	Ser	Gly	Asn	Asp	Phe	Ser	Arg	Ser	Ser	Ser	Asn	Tyr
			165					170					175		
Ile	Gly	Lys	Leu	Arg	Ser	Asn	Phe	Leu	Gly	Thr	Lys	Phe	Thr	Val	Tyr
		180					185					190			
Glu	Asn	Gln	Pro	Pro	Pro	Phe	Asn	Arg	Lys	Leu	Pro	Pro	Ser	Met	Gln
	195					200					205				
Val	Ser	Pro	Trp	Val	Ser	Ser	Ser	Ser	Ser	Ser	Tyr	Asn	Ile	Ala	Ser
	210					215					220				
Ile	Leu	Tyr	Glu	Leu	Asn	Val	Leu	Arg	Thr	Arg	Gly	Pro	Arg	Arg	Met
225				230						235				240	
Gln	Cys	Ile	Met	His	Ser	Ile	Pro	Ile	Ser	Ala	Ile	Gln	Glu	Gly	Gly

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                245                250                255
Lys Ile Gln Ser Pro Thr Glu Phe Thr Asn Gln Gly Lys Lys Lys Lys
                260                265                270
Lys Pro Leu Met Asp Phe Cys Ser Gly Asn Leu Gly Gly Glu Ser Val
                275                280                285
Ile Lys Glu Pro Leu Ile Leu Lys Asn Lys Ser Pro Arg Trp His Glu
                290                295                300
Gln Leu Gln Cys Trp Cys Leu Asn Phe Lys Gly Arg Val Thr Val Ala
305                310                315
Ser Val Lys Asn Phe Gln Leu Val Ala Ala Ala Glu Ala Gly Lys
                325                330                335
Asn Met Asn Ile Pro Glu Glu Glu Gln Asp Arg Val Ile Leu Gln Phe
                340                345                350
Gly Lys Ile Gly Lys Asp Ile Phe Thr Met Asp Tyr Arg Tyr Pro Ile
                355                360                365
Ser Ala Phe Gln Ala Phe Ala Ile Cys Leu Ser Ser Phe Asp Thr Lys
                370                375                380
Pro Val Cys Glu
385

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<210> 7

<211> 379

<212> PRT

<213> Arabidopsis sp.

<400> 7

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Met Pro Leu Ser Arg Ser Leu Leu Ser Arg Arg Ile Ser Asn Ser Phe
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Arg Phe His Gln Gly Glu Thr Thr Thr Ala Pro Glu Ser Glu Ser Ile
                20                25                30
Pro Pro Pro Ser Asn Met Ala Gly Ser Ser Ser Trp Ser Ala Met Leu
                35                40                45
Pro Glu Leu Leu Gly Glu Ile Ile Arg Arg Val Glu Glu Thr Glu Asp
                50                55                60
Arg Trp Pro Gln Arg Arg Asp Val Val Thr Cys Ala Cys Val Ser Lys
65                70                75                80
Lys Trp Arg Glu Ile Thr His Asp Phe Ala Arg Ser Ser Leu Asn Ser
                85                90                95
Gly Lys Ile Thr Phe Pro Ser Cys Leu Lys Leu Pro Gly Pro Arg Asp
                100                105                110
Phe Ser Asn Gln Cys Leu Ile Lys Arg Asn Lys Lys Thr Ser Thr Phe
                115                120                125
Tyr Leu Tyr Leu Ala Leu Thr Pro Ser Phe Thr Asp Lys Gly Lys Phe
130                135                140
Leu Leu Ala Ala Arg Arg Phe Arg Thr Gly Ala Tyr Thr Glu Tyr Ile
145                150                155                160
Ile Ser Leu Asp Ala Asp Asp Phe Ser Gln Gly Ser Asn Ala Tyr Val
                165                170                175
Gly Lys Leu Arg Ser Asp Phe Leu Gly Thr Asn Phe Thr Val Tyr Asp
                180                185                190
Ser Gln Pro Pro His Asn Gly Ala Lys Pro Ser Asn Gly Lys Ala Ser
                195                200                205
Arg Arg Phe Ala Ser Lys Gln Ile Ser Pro Gln Val Pro Ala Gly Asn
210                215                220
Phe Glu Val Gly His Val Ser Tyr Lys Phe Asn Leu Leu Lys Ser Arg
225                230                235                240
Gly Pro Arg Arg Met Val Ser Thr Leu Arg Cys Pro Ser Pro Ser Pro

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				245					250					255			
Ser	Ser	Ser	Ser	Ala	Gly	Leu	Ser	Ser	Asp	Gln	Lys	Pro	Cys	Asp	Val		
			260					265					270				
Thr	Lys	Ile	Met	Lys	Lys	Pro	Asn	Lys	Asp	Gly	Ser	Ser	Leu	Thr	Ile		
		275					280					285					
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	290					295					300						
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305					310					315					320		
Leu	Val	Ala	Thr	Val	Asp	Gln	Ser	Gln	Pro	Ser	Gly	Lys	Gly	Asp	Glu		
				325					330					335			
Glu	Thr	Val	Leu	Gln	Phe	Gly	Lys	Val	Gly	Asp	Asp	Thr	Phe	Thr			
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Met	Asp	Tyr	Arg	Gln	Pro	Leu	Ser	Ala	Phe	Gln	Ala	Phe	Ala	Ile	Cys		
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&lt;210&gt; 8

&lt;211&gt; 397

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 8

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		35					40					45					
Lys	Leu	Asp	Arg	Ala	Leu	Lys	Ser	Gln	Ser	Met	Lys	Gly	Asn	Ser	Gly		
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Phe	Pro	Thr	Glu	Val	Thr	Asn	Phe	Lys	Ser	Phe	Ser	Thr	Gly	Gly	Arg		
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Thr	Ala	Leu	Lys	Gln	Ser	Ser	Leu	Gln	Ala	Cys	Met	Gln	Lys	Asn	Ser		
				85					90					95			
Glu	Val	Asp	Lys	Ser	Ser	Phe	Gly	Met	Lys	Thr	Trp	Thr	Ser	Val	Asp		
		100						105					110				
Ser	Glu	His	Ser	Ser	Ser	Leu	Lys	Val	Trp	Glu	Phe	Ser	Asp	Ser	Glu		
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Tyr	Thr	His	Glu	Gly	Arg	Gly	Arg	Lys	Asp	Arg	Lys	Leu	Ala	Val	Ala		
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	210					215						220					
Thr	Ala	Asn	Leu	Leu	Gly	Ser	Lys	Tyr	Tyr	Ile	Trp	Asp	Lys	Gly	Val		
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				245					250					255			
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Arg	Thr	Leu	Leu	Pro	Lys	Gln	Gln	Pro	Met	Gln	Lys	Asn	Asn	Asn	Lys	
		275					280					285				
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		290				295					300					
Glu	Lys	Ile	Gln	Lys	Leu	Cys	Ser	Arg	Ile	Pro	His	Tyr	Asn	Lys	Ile	
305					310					315					320	
Ser	Lys	Gln	His	Glu	Leu	Asp	Phe	Arg	Asp	Arg	Gly	Arg	Thr	Gly	Leu	
				325					330					335		
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			340					345					350			
Pro	Arg	Gln	Thr	Ile	Leu	Gln	Met	Gly	Arg	Val	Asp	Lys	Ala	Arg	Tyr	
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<211> 380

<212> PRT

<213> Arabidopsis sp.

<400> 9

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Cys	Ala	Gly	Val	Cys	Arg	Ser	Trp	Arg	Ile	Leu	Thr	Lys	Glu	Ile	Val
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	130					135					140				
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				165				170						175	
Lys	Phe	Thr	Val	Phe	Asp	Gly	Ser	Gln	Thr	Gly	Ala	Ala	Lys	Met	Gln
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	210					215				220					
Ser	Arg	Gly	Pro	Arg	Arg	Met	Arg	Cys	Ile	Met	Asp	Thr	Ile	Pro	Met
225				230						235				240	
Ser	Ile	Val	Glu	Ser	Arg	Gly	Val	Val	Ala	Ser	Thr	Ser	Ile	Ser	Ser
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Phe	Ser	Ser	Arg	Ser	Ser	Pro	Val	Phe	Arg	Ser	His	Ser	Lys	Pro	Leu

			260					265				270			
Arg	Ser	Asn	Ser	Ala	Ser	Cys	Ser	Asp	Ser	Gly	Asn	Asn	Leu	Gly	Asp
		275						280				285			
Pro	Pro	Leu	Val	Leu	Ser	Asn	Lys	Ala	Pro	Arg	Trp	His	Glu	Gln	Leu
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Lys	Asn	Phe	Gln	Leu	Val	Ala	Val	Ser	Asp	Cys	Glu	Ala	Gly	Gln	Thr
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		340					345					350			
Thr	Met	Asp	Tyr	Gly	Tyr	Pro	Ile	Ser	Ala	Phe	Gln	Ala	Phe	Ala	Ile
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Cys	Leu	Ser	Ser	Phe	Glu	Thr	Arg	Ile	Ala	Cys	Glu				
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&lt;210&gt; 10

&lt;211&gt; 445

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 10

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Lys	Ala	Gln	Gly	Ser	Ser	Phe	Arg	Glu	Tyr	Ser	Ser	Ser	Arg	Asp	Leu
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Trp	Pro	Ala	Arg	Lys	His	Val	Val	Ala	Cys	Ala	Ser	Val	Cys	Arg	Ser
				85					90					95	
Trp	Arg	Ala	Met	Cys	Gln	Glu	Ile	Val	Leu	Gly	Pro	Glu	Ile	Cys	Gly
		100						105					110		
Lys	Leu	Thr	Phe	Pro	Val	Ser	Leu	Lys	Gln	Pro	Gly	Pro	Arg	Asp	Ala
		115						120				125			
Met	Ile	Gln	Cys	Phe	Ile	Lys	Arg	Asp	Lys	Ser	Lys	Leu	Thr	Phe	His
	130					135					140				
Leu	Phe	Leu	Cys	Leu	Ser	Pro	Ala	Leu	Leu	Val	Glu	Asn	Gly	Lys	Phe
145					150					155					160
Leu	Leu	Ser	Ala	Lys	Arg	Thr	Arg	Arg	Thr	Thr	Arg	Thr	Glu	Tyr	Ile
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Ile	Ser	Met	Asp	Ala	Asp	Asn	Ile	Ser	Arg	Ser	Ser	Asn	Ser	Tyr	Leu
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				245					250					255	
Gly	Thr	Arg	Gly	Pro	Arg	Arg	Met	His	Cys	Ile	Met	Asn	Ser	Ile	Pro
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Ala	Ser	Phe	Arg	Pro	Leu	Ile	Leu	Lys	Asn	Lys	Gln	Pro	Arg	Trp	His
			340					345					350		
Glu	Gln	Leu	Gln	Cys	Trp	Cys	Leu	Asn	Phe	Arg	Gly	Arg	Val	Thr	Val
		355					360					365			
Ala	Ser	Val	Lys	Asn	Phe	Gln	Leu	Val	Ala	Ala	Arg	Gln	Pro	Gln	Pro
		370				375					380				
Gln	Gly	Thr	Gly	Ala	Ala	Ala	Ala	Pro	Thr	Ser	Ala	Pro	Ala	His	Pro
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Glu	Gln	Asp	Lys	Val	Ile	Leu	Gln	Phe	Gly	Lys	Val	Gly	Lys	Asp	Met
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Phe	Thr	Met	Asp	Tyr	Arg	Tyr	Pro	Leu	Ser	Ala	Phe	Gln	Ala	Phe	Ala
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<210> 11
<211> 380
<212> PRT
<213> Arabidopsis sp.
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<400> 11

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Ile	Pro	Glu	Glu	Leu	Leu	Arg	Glu	Ile	Leu	Ile	Arg	Val	Glu	Ala	Ala
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Glu	Ile	Ser	Ser	Lys	Leu	Thr	Phe	Pro	Ile	Ser	Leu	Lys	Gln	Pro	Gly
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Pro	Arg	Asp	Ser	Leu	Val	Gln	Cys	Phe	Ile	Lys	Arg	Asn	Arg	Ile	Thr
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Gln	Ser	Tyr	His	Leu	Tyr	Leu	Gly	Leu	Thr	Asn	Ser	Leu	Thr	Asp	Asp
		115					120					125			
Gly	Lys	Phe	Leu	Leu	Ala	Ala	Cys	Lys	Leu	Lys	His	Thr	Thr	Cys	Thr
	130				135						140				
Asp	Tyr	Ile	Ile	Ser	Leu	Arg	Ser	Asp	Asp	Met	Ser	Arg	Arg	Ser	Gln
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			340					345					350		
Thr	Met	Asp	Tyr	Gly	Tyr	Pro	Ile	Ser	Ala	Phe	Gln	Ala	Phe	Ala	Ile
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Cys	Leu	Ser	Ser	Phe	Glu	Thr	Arg	Ile	Ala	Cys	Glu				
	370					375					380				

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&lt;211&gt; 1365

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 12

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&lt;211&gt; 1182

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 13

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&lt;211&gt; 1218

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 14

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&lt;212&gt; DNA

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 15

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&lt;211&gt; 1287

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 16

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&lt;211&gt; 1164

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 17

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&lt;211&gt; 1137

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 18

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&lt;211&gt; 1191

&lt;212&gt; DNA

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 19

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&lt;212&gt; DNA

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 20

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&lt;212&gt; DNA

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 21

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&lt;212&gt; DNA

&lt;213&gt; Arabidopsis sp.

&lt;400&gt; 22

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&lt;400&gt; 23

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&lt;223&gt; Primer

&lt;400&gt; 24

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